AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1-29. (*Cancelled*).

30. (*Currently Amended*) A method of stabilizing a short-pulse fiber laser, comprising:

isolating said fiber laser in temperature-controlled enclosure from an external environment; and

~~wrapping said fiber laser onto a fiber spool; and~~

operating the enclosure to stabilize a repetition rate of the fiber laser~~ while said fiber laser remains wrapped on said fiber spool~~.

31. (*Currently Amended*) The method for stabilizing a short-pulse fiber laser claimed in claim 30, wherein said fiber laser is wrapped onto a fiber spool~~ is acoustically damped~~.

32. (*Currently Amended*) The method for stabilizing a short-pulse laser claimed in claim 31[[30]], wherein thermal expansion of said fiber spool is matched to that of said optical fiber.

33. (*Currently Amended*) The method for stabilizing a short-pulse laser claimed in claim 31[[30]], wherein the fiber spool is acoustically damped~~further comprising:~~

~~placing the short-pulse laser in a temperature-controlled enclosure~~.

34. (*Currently Amended*) The method as claimed in claim 30, wherein the short-pulse laser is a first short-pulse laser and the stability of a second short-pulse laser is controlled along with the stability of the first short-pulse laser and wherein, further, the first and second short-pulse lasers are fiber lasers, the method comprising:

constructing the first and second short-pulse lasers from identical components in an identical fashion;

pumping the first and second short-pulse lasers with a shared laser;

wrapping the first and second short-pulse lasers on a shared fiber spool; and

placing the first and second short-pulse lasers in said ~~a single~~ enclosure.

35. (*Cancelled*).

36. (*Currently Amended*) The method as claimed in claim 34, wherein the method further comprises ~~further comprising:~~ holding to zero a time-averaged cavity length mismatch of the fiber laser.

37. (*Currently Amended*) A method of reducing timing jitter between two short-pulse fiber lasers, the method comprising[[:]] co-wrapping the two fiber lasers on a single fiber spool.

38. (*Currently Amended*) The [[A]] method as claimed in claim 37, wherein the method further comprises~~comprising~~:

driving the two fiber lasers with a single pump source; and

enclosing the two fiber lasers in a single enclosure.

39. (*Currently Amended*) The [[A]] method as claimed in claim 38, wherein the method further comprises ~~comprising:~~ controlling the environment within the single enclosure relative to the environment external to the single enclosure.

40. (*Currently Amended*) The [[A]] method as claimed in claim 37, wherein the method further comprises ~~comprising:~~ independently controlling the two fiber lasers.

41. (*Currently Amended*) A method of stabilizing a fiber laser, comprising:

isolating the fiber laser from an external environment in a temperature-controlled enclosure; and

adjusting the length of a cavity of the fiber laser in response to a temperature change ~~changes~~ in the enclosure~~environmental conditions~~.

42. (*Currently Amended*) The [[A]] method as claimed in claim 41, wherein the method further comprises ~~comprising:~~ altering the repetition rate of the laser with a piezoelectric transducer, wherein the laser is a short-pulse laser.

43. (*Currently Amended*) The [[A]] method as claimed in claim 42, wherein the method further comprises ~~comprising:~~ conditioning a drive signal of the piezoelectric transducer to avoid abrupt voltage changes on the leading or falling edges of the drive signal at the input to the piezoelectric transducer.

44. (*Currently Amended*) The [[A]] method as claimed in claim 42, wherein the method further comprises ~~comprising:~~ driving the piezoelectric transducer with a sinusoidal drive signal.

45. (*Currently Amended*) A fiber laser system comprising:

a first rare-earth doped fiber operable to conduct optical energy; and

a spool around which said first fiber is wrapped,

wherein said first rare-earth doped fiber is isolated from external environmental conditions in a temperature-controlled enclosure.

46. (*Currently Amended*) The [[A]] fiber laser system as claimed in claim 45, wherein said enclosure is acoustically damped~~further comprising:~~

~~an enclosure operable to environmentally isolate said first fiber and said spool~~.

47. (*Previously Presented*) The [[A]] fiber laser system as claimed in claim 45, further comprising:

a second fiber co-wrapped around said spool; and

a single optical pump source operable to drive both said first and second fibers.

48. (*Currently Amended*) The [[A]] fiber laser system as claimed in claim 45, further comprising[[:]]

a piezoelectric transducer operable to alter a ~~the~~ cavity length ~~of said laser~~.

49. (*Currently Amended*) The [[A]] fiber laser system as claimed in claim 47[[45]], further comprising[[:]]

dithering means for dithering the outputs of said first and second fibers.

50. (*Currently Amended*) The [[A]] fiber laser system as claimed in claim 49, wherein the output of said first fiber is dithered at a scan frequency and the output of said second fiber is dithered at a rate substantially equal to the average repetition rate of the output of said first fiber.

51. (*Currently Amended*) The [[A]] fiber laser system as claimed in claim 47, further comprising:

a first Faraday rotator mirror at an end of said first fiber;

an optical assembly comprising a second Faraday rotator mirror and a piezoelectric transducer mounted on a mirror.

52. (*Currently Amended*) <u>The</u> [[A]] fiber laser system as claimed in claim 51, further comprising:

at least two identical sets of modelocking optics, each set of modelocking optics comprising a waveplate, a Faraday rotator and a polorizable beamsplitter, wherein at least one set of modelocking optics is associated with said first fiber and at least one other set of modelocking optics is associated with said second fiber.

53. (*Currently Amended*) A short-pulse laser, comprising:

a fiber laser for generating a pulse output; and

<u>an acoustically damped</u> ~~a~~ fiber spool, around which said fiber laser is wrapped to <u>stabilize the output</u> ~~improve operational stability~~ of said fiber laser.

54. (*Previously Presented*) A method of stabilizing a short-pulse fiber laser, comprising:

placing the short-pulse fiber laser in a temperature-controlled enclosure;

isolating said fiber laser from an external environment;

controlling the temperature within the temperature-controlled enclosure to stabilize the laser.

55. (*Currently Amended*) The method for stabilizing a short-pulse fiber laser claimed in claim 54, further comprising:

wrapping said fiber laser onto an acoustically damped ~~a~~ fiber spool~~; and~~

~~operating the fiber laser while said fiber laser remains wrapped on said fiber spool~~.

56. (*Cancelled*).

57. (*Previously Presented*) A method of controlling the output of a short-pulse fiber laser, comprising:

stabilizing a repetition rate of the laser by controlling the temperature of the fiber.

58. (*Currently Amended*) The [[A]] method as claimed in claim 57 further comprising:

providing a piezoelectric transducer in communication with the laser; and

applying a voltage to the piezoelectric transducer,

wherein the repetition rate of the laser is controlled by movement of the piezoelectric transducer.

59. (*Currently Amended*) The [[A]] method as claimed in claim 58 further comprising:

providing a phase locked loop circuit for controlling the average repetition rate of the laser.

60. (*Currently Amended*) A fiber laser system comprising:

a first fiber operable to conduct optical energy; and

a spool around which said first fiber is wrapped,

wherein said first fiber is isolated from external environmental conditions <u>in a temperature-controlled enclosure</u> and held near ambient temperature.

61. (*Currently Amended*) A fiber laser system comprising:

a first fiber operable to conduct optical energy; and

a spool around which said first fiber is wrapped,

wherein said first fiber is isolated from external environmental conditions <u>in a temperature-controlled enclosure</u> and held above ambient temperature.

62. (*Withdrawn*) A laser apparatus comprising:

first and second short-pulse lasers each having a laser cavity; and

a phase-locked loop circuit operable to receive respective pulses from said first and second short-pulse lasers and generate a proportional output,

wherein at least one of said first and second lasers is a mode-locked laser and comprises a length changing unit, said length changing unit being operable to change the length of said laser cavity based on the proportional output of the phase locked loop circuit.

63. (*Withdrawn*) A laser apparatus as claimed in claim 62, wherein the mode-locked laser or lasers is passively mode-locked.

64. (*Withdrawn*) A laser apparatus as claimed in claim 62, wherein the length changing unit comprises a piezoelectric transducer (PZT).

65. (*Withdrawn*) A laser apparatus as claimed in claim 62, wherein the mode-locked laser is a fiber laser and the length changing unit is operable to stretch the length of the fiber.

66. (*Withdrawn*) A laser apparatus as claimed in claim 62, wherein the length changing unit comprises a temperature control device.

67. (*Withdrawn*) A laser apparatus as claimed in claim 62, wherein the length changing unit comprises a temperature control device operable to control the temperature of at least one of the lasers.

68. (*Withdrawn*) A laser apparatus as claimed in claim 62, wherein the length changing unit comprises an environmental enclosure operable to control environmental conditions experienced by at least one of the lasers.

69. (*Withdrawn*) A laser apparatus as claimed in claim 62, wherein the phase locked loop circuit comprises a stabilizer and a PZT controller.

70. (*Withdrawn*) A laser apparatus as claimed in claim 62, wherein the first and second short-pulse lasers are synchronized and stabilized by the proportional output, wherein the proportional output is a measure of a difference between the respective pulses from said first and second short-pulse lasers.

71. (*Withdrawn*) A method as claimed in claim 59, wherein a bandwidth of the phase locked loop circuit is less than a frequency of the movement of the piezoelectric transducer.

72. (*Withdrawn*) A method as claimed in claim 59, wherein the short-pulse fiber laser is mode-locked.

73. (*Withdrawn*) A method of controlling the output of a short-pulse fiber laser, comprising:

providing a phase-locked loop circuit operable to stabilize a repetition rate of the short-pulse fiber laser;

providing a piezoelectric transducer in communication with the short-pulse fiber laser; and

applying a voltage to the piezoelectric transducer,

wherein the repetition rate of the short-pulse fiber laser is controlled by movement of the piezoelectric transducer.

74. (*Withdrawn*) A method of controlling the output of a short-pulse fiber laser, comprising:

providing a phase-locked loop circuit operable to stabilize a repetition rate of the short-pulse fiber laser;

providing a temperature control device that is in communication with the short-pulse fiber laser and operable to receive an output from said phase-locked loop circuit,

wherein the repetition rate of the short-pulse fiber laser is controlled by controlling the temperature of the short-pulse fiber laser based on the output from said phase-locked loop circuit.

75. (*Withdrawn*) A method of controlling the output of a short-pulse fiber laser, comprising:

providing at least one phase-locked loop circuit operable to stabilize a signal synchronized to the repetition rate of the short-pulse fiber laser;

providing an environment control device that is in communication with the short-pulse fiber laser and operable to receive an output from said phase-locked loop circuit,

wherein the repetition rate of the short-pulse fiber laser is controlled by controlling the environmental conditions experienced by the short-pulse fiber laser based on the output from said phase-locked loop circuit.